

Artificial Intelligence, Robotization, and Population Decline: Toward a Full-Employment Model with Guaranteed Work, Reduced Working Hours, and Lower Retirement Age to Ensure Personal, Social, and Environmental Well-Being

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Abstract

The accelerated development of artificial intelligence (AI) and robotics presents a twofold scenario: on one hand, the risk of massive structural unemployment and wealth concentration; on the other, the historic opportunity to drastically reduce human labor, redistribute income, and alleviate environmental pressure. This article argues that the outcome between these two extremes is not technologically deterministic, but politically contingent. An integrated model is proposed that combines: (1) a Job Guarantee (JG) policy as an employer of last resort; (2) a progressive reduction of the working week to 25 hours, with 5 hours dedicated to continuous training; (3) an active tutored retirement between ages 60 and 62; (4) a set of incentivized (non-coercive) population decline policies; (5) development-in-origin strategies to discourage forced emigration; (6) de-urbanization policies oriented toward mid-sized cities and rehabilitated rural areas. The model is financed through Modern Monetary Theory (MMT) and a system of tax deductions that incentivize senior hiring. It is concluded that AI and robotization, far from being a threat, are a condition of possibility for transitioning toward a society with less compulsory work, greater personal well-being, social cohesion, and environmental sustainability.

Keywords: Artificial intelligence, robotization, guaranteed work, population decline, de-urbanization, Modern Monetary Theory, full employment.

1. Introduction

Since the First Industrial Revolution, each technological wave has generated apocalyptic fears about the end of work. Until now, history has shown an absorption and job-creation capacity greater than the initial destruction. However, the emergence of generative AI and advanced robotics presents a qualitative difference: for the first time, automation affects not only routine physical labor but also non-routine cognitive work (medical diagnosis, translation, writing, basic programming, legal analysis). As Acemoglu and Restrepo (2022) point out, the elasticity of substitution between capital and labor could reach unprecedented levels, generating a persistent decline in labor's share of national income.

This article starts from an explicit normative premise: the goal of the economic system should not be to maximize production or technical efficiency, but to maximize human and ecological well-being. From this perspective, AI and robotization are not a problem to be solved, but a tool to free up human time, redistribute work, and reduce the environmental footprint. However, this opportunity will only materialize if a set of active employment, fiscal, territorial, and demographic policies are implemented. The following sections develop: (2) the diagnosis of automation as threat and opportunity; (3) the proposal for a Job Guarantee and work-sharing; (4) tutored retirement as knowledge transmission; (5) the financing framework based on MMT and tax deductions; (6) policies for population decline, development in origin, and de-urbanization; (7) the systemic integration of all variables; (8) conclusions and future research directions.

2. The Dual Character of Automation: Destruction and Liberation

Economic literature distinguishes between displacement effects and productivity effects. When a machine replaces a worker, direct displacement occurs. But if that same machine lowers costs, it can expand demand and generate new jobs in other sectors. The problem is that under the current institutional framework (wage labor as the sole source of income, long working hours, absence of basic income or employment guarantees), the temporary mismatch between destruction and creation can be socially devastating (Ford, 2015).

Authors such as Frey and Osborne (2017) estimated that 47% of U.S. jobs are at high risk of automation. Although subsequent revisions have moderated these

figures (Arntz et al., 2016), the consensus points to an accelerated transformation of tasks, not necessarily a massive disappearance. The real risk is not total technological unemployment, but precarization and polarization: high-skill jobs (complementing AI) and low-skill jobs (difficult to automate but poorly paid) expand, while intermediate jobs (administrative, machine operators) contract.

This article proposes an alternative hypothesis: automation can be a vehicle for the generalized reduction of working hours, if combined with work-sharing policies. Instead of maintaining the 40-hour week and leaving part of the population unemployed, the idea is to distribute the available work (assisted by AI) among the entire active population, proportionally reducing working hours. This idea has illustrious precursors (Gorz, 1997; Rifkin, 1995), but it suffered from a feasibility problem: without an employer of last resort guaranteeing work to those who seek it, voluntary sharing fails. This is where the Job Guarantee comes in.

3. The Job Guarantee (JG) as a Pillar of the Model

The Job Guarantee is a proposal of post-Keynesian origin and Modern Monetary Theory, especially associated with Hyman Minsky, L. Randall Wray, and Pavlina Tcherneva (2018). Its basic idea is that the State commits to offering a public job to any unemployed person who wants to work, at a decent minimum wage, in tasks of social utility (care, environment, culture, infrastructure).

Compared to Universal Basic Income (UBI), the JG has advantages and disadvantages. UBI provides income without counterpart, which fully respects individual autonomy, but it may generate incentive problems and, above all, does not solve the human need for purpose and social recognition. The JG, in contrast, provides meaningful work, restores self-esteem, and prevents the social exclusion associated with long-term unemployment.

In our model, the JG is not a residual job but the institutional skeleton of full employment. Its functioning would be:

- **Universal right:** Every adult citizen without formal employment can apply for a JG position.
- **Reduced working hours:** 25 hours per week, of which 20 are productive work (in care, ecology, culture, repair, etc.) and 5 are mandatory and paid continuous training.

- **Salary:** Equivalent to the professional minimum wage (not a poverty wage).
- **Financing:** Via a tax on automation and monetary issuance under counter-cyclical supervision (MMT).

The introduction of the JG turns the threat of automation into an opportunity: any worker displaced by a robot is guaranteed an alternative job of social utility. This eliminates fear of technological change and allows companies to adopt AI without generating social trauma.

4. Reduction of Working Hours and Continuous Training

Concrete proposal:

Stage	Total hours	Productive work	Continuous training
Transition (2027)	35h	30h	5h
Consolidation (2029)	30h	25h	5h
Maturity (2030)	25h	20h	5h

The 5 hours of weekly continuous training are mandatory for all workers (both in the private sector and in the JG). The content adapts to the rapid obsolescence of skills in the AI era: AI literacy applied to the sector, ethics and human judgment, social skills, technical updating. AI itself acts as a personalized tutor, adapting content to each worker's pace and gaps.

Various studies support this idea: continuous training within working hours (paid educational leave) increases productivity, reduces turnover, and improves workers' mental health (ILO, 2021). The novelty here is its symmetric mandatory nature: no one can be left behind due to lack of time or means to train.

5. Reduction of the Retirement Age

Retirement with a transition system for knowledge transmission is one of the most innovative elements of the proposed model. Inspired by experiences of "gradual retirement" and "reverse mentoring," it proposes:

- **Ordinary full retirement age:** 62 years (compared to the current 67 in many countries).
- **Two preceding years (60-62):** the worker may choose to shift their functions from direct production to senior transmission and innovation roles.
- **Working hours:** 25 hours per week, of which 15-20h are tutoring (mentoring juniors) and process improvement (participation in committees, innovation projects), and 5h of continuous training adapted to their new role (how to teach, feedback methodologies, use of AI tutoring platforms).
- **Salary:** the same salary is maintained (or even a small bonus for mentoring function), financed by the State through 100% tax deduction of the salary cost for the company.

This policy solves three problems simultaneously:

1. **Loss of tacit knowledge:** The senior has 30-40 years of experience that AI cannot capture (context, intuition, relationships). Their transmission is irreplaceable.
2. **Subjective obsolescence of older workers:** Many older workers feel displaced by new technologies. The mentoring role restores their self-esteem and social usefulness.
3. **Pension costs:** By keeping the senior contributing for two more years (with salary, not pension), public spending on retirement is alleviated.

Empirical evidence shows that senior mentoring programs improve youth retention, reduce errors, and increase incremental innovation (Kautz et al., 2021).

This proposal raises a fundamental issue: lowering the retirement age in an economy where education is increasingly longer (degrees, master's, doctorates) means that workers may accumulate fewer years of effective contributions, which would make the thresholds for 100% pensions unattainable for most of the population.

In this context, reducing the contribution threshold for 100% of the pension from 38 to 35 years, and capitalizing formal education as contributed years, is an essential part of the proposal. Thus, all periods of formal education would be recognized as contributed years for pension purposes: intermediate and higher vocational cycles, specialization courses, and university degrees, master's, and doctorates.

6. Financing Framework: Modern Monetary Theory and Tax Deductions

6.1 The Role of MMT

Modern Monetary Theory (MMT) holds that a State with monetary sovereignty (issues its own currency, not fixed to a gold standard) can never be forced to default on its payments in that currency. It can spend by creating money ex nihilo. The real limit is not financial but inflationary: if public spending exceeds the economy's productive capacity, inflation arises.

Applied to our model, this means that the State can finance the JG and tutored retirement without needing to increase taxes beforehand. The relevant constraint is that the economy must have idle real resources (unemployed workers, underused productive capacity). In a phase of massive automation, such idle capacity will be abundant. Inflation is controlled because spending is directed to employing the unemployed (who produce useful goods and services) and seniors (who continue contributing, not just consuming).

6.2 Tax Deductions as a Microeconomic Incentive

While MMT operates at the macro level, tax deductions solve the problem of business incentives. Proposal:

- **100% deduction** of the senior worker's salary (60-62 years) for the company that hires them for tutoring/innovation functions.
- No salary caps (key critique: Malaysia set a limit that discouraged hiring qualified professionals).
- Possible additional deduction (e.g., 120%) if the improvements resulting from the senior's proposals lead to documented technical, scientific, social, or environmental improvements.
- Salary financed by the State for small or non-profit companies (through the senior JG).

Combining MMT and deductions, the net cost for the State is the senior's salary (financed with money creation), but the company receives it free, and society obtains knowledge transfer and process improvement. This is a triple win.

7. Incentivized Population Decline, Development-in-Origin Anti-Migration Policies, De-Urbanization, and Tourism Restrictions Based on Territorial Carrying Capacity

No model of guaranteed employment and reduced working hours is sustainable in the long term without addressing demographic and territorial pressure.

7.1 Voluntary Population Decline

A set of incentivizing (non-coercive) policies is proposed to reduce the fertility rate to below replacement levels (1.6-1.8 children per woman) over several decades:

- **Inverse tax deductions:** fewer children, lower taxes (or more deductions).
- **Priority access to subsidized housing** for childless couples or those with one child.
- **Universal and free guarantee** of contraceptives and safe abortion.
- **Mandatory sex and life education** that de-normalizes social pressure to have children.

Evidence from countries like South Korea, Japan, or Spain shows that when material conditions allow choice, fertility falls below replacement without coercion. The model proposes not to counteract this trend with pronatalist policies (baby checks, extended paid leave), but to accept it and manage its consequences (aging) with AI, robotics, and a care-oriented JG.

7.2 Development-in-Origin Anti-Migration Policies

Forced emigration due to poverty or violence is a tragedy. The solution is not walls, but making emigration unnecessary. Concrete policies:

- **Structural fair trade:** guaranteed minimum prices for Global South products.
- **Forced technology transfer:** Northern companies operating in the South must transfer patents and know-how.
- **Compensation funds for brain drain:** a tax on rich countries hiring skilled professionals from poor countries, with funds reinvested in local training.
- **Judicial cooperation** to dismantle human trafficking mafias.

Development in origin reduces migratory pressure, allowing migration flows to be by choice, not necessity. This, in turn, reduces labor competition in rich

countries and allows the application of JG and work-sharing policies without xenophobic tensions.

7.3 De-Urbanization

Megacities are environmentally unsustainable and generate stress, isolation, and inequality. De-urbanization policies:

- **Territorial taxation:** higher taxes on housing in large cities, rebates in depopulated areas.
- **Right to telework** for all remote-able positions.
- **Investment in 15-minute cities** in mid-sized municipalities (50k-200k inhabitants).
- **Selective dismantling** of urban infrastructures that incentivize concentration (highways, subways).
- **Indicative legal limit** on urban size (e.g., no municipality may exceed 500,000 inhabitants).

AI and robotization make de-urbanization possible: telemedicine, tele-education, delivery drones, autonomous maintenance. What previously required concentration (high-complexity hospitals, universities, logistics) can now be distributed territorially with the support of intelligent technologies.

7.4 Tourism Restrictions Based on Territorial Carrying Capacity

Unregulated mass tourism concentrates its impact on vulnerable ecosystems and communities, contradicting the objectives of de-urbanization and population decline. Territorial Carrying Capacity (TCC) is defined as the maximum number of visitors a destination can support without environmental, social, or cultural damage. We propose establishing the TCC as a binding legal limit, monitored through IoT sensors and computer vision. A progressive tourist tax (higher as the limit approaches) discourages overcrowding in high season. In fragile spaces (parks, virgin beaches), daily visitor rights auctions are implemented. Upon reaching 80% of the TCC, an automatic moratorium on new hotel beds is activated. Off-season tourism is fiscally rewarded to distribute the annual load. In saturated destinations, stay limits per visitor are established (e.g., 14 nights/year) with centralized registration. Flights of less than 600 km are prohibited when a high-speed rail alternative exists. AI enables dynamic management: peak prediction, real-time alternative destination recommendations, and electronic verification of limits.

The model is consistent with population decline (less human pressure) and with the Job Guarantee (conversion of precarious tourism jobs). Seniors with hotel experience can train new generations in low-intensity tourism during their

tutored retirement. Applied to the Balearic Islands (16M tourists for 1.2M residents), we propose reducing to 10M annually with progressive taxation and hotel moratorium. Expected results: fewer tourists but higher spending per visitor, housing recovery for residents, and ecosystem preservation. Tourist limitation is not optional: without it, any progress in domestic sustainability is offset by the footprint of mass tourism.

8. Systemic Integration of the Model

The complete model, which I call the Automated Full Employment with Agreed Decline (AFE-AD) Model, is summarized in the following table:

Variable	Current state (reference)	AFE-AD Proposal
Working hours	40h/week	25h (20 productive + 5 training)
Retirement age	67 years	62 years (with 2 optional tutoring years)
Guaranteed employment	Does not exist	Yes, universal JG (25h)
Financing	Conventional taxation	MMT + automation tax + deductions
Fertility rate (children/woman)	1.5-2.5 depending on country	1.6-1.8 (incentives to lower fertility)
Migration	Forced by inequality	Development in origin: nearly zero net migration
Urbanization pattern	Growing megacities	Mid-sized cities + rehabilitated villages
Automation impact	Job substitution without plan	Time liberation, senior transmission, JG

9. Discussion

The presented model faces several potential objections.

First objection: MMT is not accepted by orthodox economics, which considers that excessive money creation always generates hyperinflation. **Response:** The experience of Japan (public debt >250% of GDP without inflation) and the eurozone after the pandemic (massive quantitative easing without hyperinflation) shows that the link between monetary issuance and inflation is mediated by idle productive capacity and expectation anchoring. In an economy undergoing automation, with structural unemployment, idle capacity is enormous.

Second objection: Incentivized population decline is a form of eugenics or imposition on lower classes. **Response:** Precisely because current pronatalist policies benefit middle-upper classes more (baby checks, tax deductions), reversing incentives can be progressive. Moreover, universal access to contraceptives and abortion is a historical feminist demand. No one is penalized for having children; subsidies are simply stopped.

Third objection: De-urbanization goes against people's revealed preferences (most still migrate to cities). **Response:** Preferences are conditioned by the opportunity structure. If investment is made in high-speed rail networks, rural fiber optics, regional hospitals, and affordable housing in villages, many people would choose these environments. Evidence from the pandemic (telework, temporary urban exodus) points in this direction.

Fourth objection: The JG bureaucratizes the economy and may become a "junk job" without real utility. **Response:** Design matters. To avoid this, the JG should focus on care and regeneration tasks that technology cannot (or should not) replace: elder companionship, small-group early childhood education, local organic farming, ecosystem restoration, cultural heritage. These tasks are socially valuable and not easily automatable.

10. Conclusions

Artificial intelligence and robotization do not have a univocal impact on employment, well-being, or the environment. Their effect depends on the policies that frame them. If the current regime of 40-hour weeks, market wages, and absence of a safety net is maintained, automation will deepen inequality and generate structural unemployment.

Conversely, if a coordinated set of policies is implemented – Job Guarantee as employer of last resort, reduction of the working week to 25 hours (with 5 hours

of training), active tutored retirement at 60-62 years, financing via MMT and tax deductions, and policies of incentivized population decline, development in origin, and de-urbanization – then automation becomes a historic opportunity to free human time, redistribute work, improve quality of life, and reduce the ecological footprint.

The model outlined here is ambitious, and its implementation would require profound institutional changes and a political will that seems absent today. However, the ongoing ecological and social crisis may eventually impose solutions of this kind out of sheer necessity. The question is not whether automation will arrive, but for whom and for what purposes. This article has presented one possible path.

Future research lines include: (i) quantitative modeling of the impact of the JG, working hours reduction, retirement age, and the proposed model on GDP, inflation, and income distribution; (ii) case studies of JG pilots in different regions; (iii) analysis of the political acceptability of the model (attitudes of employers, unions, and citizens); (iv) demographic simulations of long-term incentivized decline.

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